of the seven error consequence categories recorded in the MEDMARX dataset. Both variable and opportunity costs (2006 values) were considered, including medication, laboratory, lost revenue, and labor. When a particular consequence is indicated for an error report, the corresponding costs were applied to derive the estimated mean cost for each error cause. **RESULTS:** Between July 1, 2000 and June 30, 2005, 2356 records were identified as IV PCA errors. The most common error causes were human factors (79.3%) and equipment-related factors (25.1%). The overall mean cost was $733 per event, consisting of $241 in variable costs and $491 in opportunity costs. When stratified by error causes, errors associated with equipment-related and communication factors were the most expensive ($1189 and $1166). Greater than 10% of the errors resulted in patient harm and were overwhelmingly more costly than non-harmful events ($6621 versus $55). **CONCLUSION:** When accounting for the full impact of IV PCA errors, they are associated with high costs to hospitals. This study provides an innovative approach to estimating the cost of IV PCA medication errors. Additional research is necessary to validate these findings.

PPN12

PETS, PEOPLE AND DEMAND FOR ETODOLAC IN THE UNITED STATES OF AMERICA

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OBJECTIVES: To compare price and demand for pharmaceuticals for human and companion animal markets to provide insight into the relative importance of institutional factors or underlying market demand in determining price and utilization for pharmaceuticals in humans. The large majority of owners of companion animals pay the market price for pharmaceutical therapy. Even when pet insurance exist, insurers can charge the expected cost of providing services. In contrast, access to health care for humans is considered an important policy objective, third party payment is the norm, and insurers are typically not free to adjust for an individual's expected costs. **METHODS:** Comparative review of human and animal regulatory systems, compilation of public estimates for R&D costs, and estimation of linear demand curves for Etodolac in human and companion animal markets. Prices and quantities for Etodolac are taken from studies conducted for the United States Congress. **RESULTS:** Regulatory processes for both human and pets are similar, but human development costs are much higher due to the greater cost of clinical trials in humans. Average cost per drug approved are estimated at $800 Million for humans and $40 Million for pets (all prices in 2001 dollars) using similar pricing methodologies. We estimate demand in the human market as: $Q = 4.8789 - 0.0173P$ (Q in millions of monthly prescriptions per year, P in dollars). For animals the demand equation is $Q = 0.7688 - 0.0061P$ (units as for humans). If marginal cost pricing were instituted, elasticity of demand would be –0.016 for humans and –0.037 for pets. **CONCLUSION:** Even at very low prices, we find evidence of less price responsiveness in human pharmaceutical markets, suggesting that institutional factors increase the demand for pharmaceuticals and this effect is quantitatively important.

PPN14

OFF-LABEL OPIOID USE IN THE TREATMENT OF CHRONIC PAIN

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OBJECTIVES: To identify whether patients using Actiq, an oral lozenge formulation of the powerful opioid fentanyl, have any evidence of cancer according to administrative claims records. The Food and Drug Administration has approved Actiq for breakthrough cancer pain and patients without such a diagnosis should therefore be considered off-label. **METHODS:** Pharmacy claims spanning the dates 2002 until 2005 from two large Midwestern and Southern health plans were used to identify patients receiving at least one Actiq prescription according to National Drug Codes. All medical claims for these patients were then searched for any primary or benign cancer diagnosis to identify whether the population potentially qualified for use of the drug according to Food and Drug Administration labeling. **RESULTS:** Of 1,481 patients identified with Actiq, only 399 (26.9%) had any evidence of cancer. The remaining 1,082 patients (73.1%) potentially received Actiq in an off-label setting. By year, the ratio of on versus off-label users was essentially unchanged from 2002 through 2005. However, the total number of users identified by year doubled from 220 in 2002 to 439 in 2005. **CONCLUSION:** The majority of Actiq prescriptions may be off-label. Given that the drug is a powerful, habit-forming opioid, these data suggest that the use of this drug should be considered for specific utilization review by insurers. These data also track recent evidence indicating that the use of these drugs has increased rapidly in recent years. Future work should examine whether off-label use of Actiq may be related to patient copay or other benefit design characteristics.

PPN15

EXAMINING FAMILY PHYSICIANS' ATTITUDES AND WILLINGNESS TO PRESCRIBE LONG-ACTING OPIOIDS TO PATIENTS WITH MODERATE TO SEVERE CHRONIC NONMALIGNANT PAIN

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OBJECTIVES: To examine family physicians' attitudes and willingness to prescribe long-acting opioids to patients with moderate to severe chronic nonmalignant pain (CNMP). **METHODS:** The ory of Planned Behavior (TPB) was used to examine the underlying constructs (i.e., attitude, social influences, and perceived control) believed to influence physicians' willingness to prescribe long-acting opioids for CNMP. Three focus groups were conducted and a web-based survey was developed, pretested, and e-mailed to 2750 Texas family physicians. A total of 64 Likert-type questions were used to assess the predictors of physicians' willingness to prescribe, and 10 of these items measured physicians' attitudes (summed range = –90 to +90). **RESULTS:** A total of 267 family physicians completed the questionnaire. The TPB model accounted for 39% ($F3222 = 47.4$, $p < 0.001$) of the variance in explaining physicians' willingness to prescribe. Most physicians (N = 179, 66%) indicated that they were willing to prescribe long-acting opioids to their CNMP patients. Physicians unwilling to prescribe long-acting opioids for CNMP had an overall unfavorable attitude (Mean = –7.87, SD = 17.43) compared to willing physicians (Mean = +9.56, SD = 17.42). Unwilling physicians held stronger beliefs that prescribing opioids would lead to patient abuse, addiction and regulatory scrutiny compared to willing physicians. A significant positive relationship was found between previous prescribing of long-acting opioids and attitude ($R = 0.46$, $p < 0.01$). Respondents who prescribed long-acting opioids more often were less likely to believe that it would lead to abusive and addictive behaviors, while those who prescribed less often were more likely to believe that it would lead to regulatory scrutiny. **CONCLUSION:** The TPB model was a significant predictor of physicians'

willingness to prescribe long-acting opioids. Two-thirds of the family physicians were willing to prescribe long-acting opioids for moderate to severe CNMP. However, attitudinal barriers exist among those physicians unwilling to prescribe. Educational interventions should focus on these barriers.

PPN16

PRESCRIBING OF FENTANYL PATCHES TO NON-OPIOID TOLERANT PATIENTS IN THE MILITARY HEALTH SYSTEM (MHS)

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OBJECTIVES: As a result of safety concerns, labeling for fentanyl patches was strengthened in June 2005 to limit use to opioid-tolerant patients only. We evaluated prior opioid use in MHS patients prescribed fentanyl patches to support the DoD Pharmacy & Therapeutics Committee decision-making process. **METHODS:** Study patients included all MHS patients newly started on fentanyl patch from Jan–Dec 05 (no fentanyl patch prescription ≤180 days prior to index date). Patients were assumed to be opioid-tolerant based on prescriptions for a defined set of opioids considered potentially equipotent to a starting dose of fentanyl patch (25 mcg/hr) filled during 45–60 days prior to their index date, or if hospitalized on or during 7–14 days prior to their index date (since opioids might have been started during hospitalization). We did not estimate cumulative dose or duration of opioids. Duration of "look-back" periods and the defined set of opioids were varied to provide information on prescribing patterns. Prescription data were obtained from DoD's Prescription Data Transaction Service Data Warehouse, hospitalization data from the MHS Management Analysis and Reporting Tool. **RESULTS:** The percentage of patients that could not be assumed to be opioid-tolerant prior to starting fentanyl patch ranged from 27% to 51%; it was most sensitive to changes in how potentially equipotent opioids were defined. Results from 3-month periods before (January–March 2005) and after (October–December 2005) labeling changes were similar. **CONCLUSION:** The number of MHS patients who are not opioid-tolerant prior to starting fentanyl patches is potentially large. Assessments of changes in prescribing behavior following educational efforts are underway. DoD decided in January 2007 to require prior authorization for fentanyl patches, based on prior opioid use.

PAIN—Patient-Reported Outcomes

PPN17

QUANTIFYING HEALTH RELATED QUALITY OF LIFE IN A CHRONIC PAIN POPULATION: PRELIMINARY RESULTS

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OBJECTIVES: To assess the sensitivity of the EQ-5D in differentiating between severities of pain related health status (PRHS). **METHODS:** Study is being conducted with chronic pain patients attending a specialty pain centre in Edmonton, Alberta, Canada. Self reported PRHS was determined using standardized clinical measures that included the Pain Disability Index and The Facial Pain Scale. These measures were slightly modified to facilitate comprehension based on information generated from pilot testing. Patients were categorized according to their PRHS and the EQ-5D was administered to quantify their health utility. Linear regressions were used to compare health utilities between severity levels of PHS adjusting for gender, marital status, age, month as a patient, smoking status and income. **RESULTS:** Sixty-four patients have been assessed. The mean utility was 0.5524 (n = 30) for persons with moderate disability and severe pain (MDSP), 0.3625 (n = 9) for persons with severe disability and extreme pain (SDEP), 0.3358 (n = 22) for persons with severe disability and severe pain (SDSP), and 0.2965 (n = 3) for persons with moderate disability and extreme pain (MDEP). Compared to persons with MDSP, persons with SDSP were associated with a –0.225 utility decrement ($p < 0.001$), and persons with SDEP associated with a –0.240 utility decrement ($p = 0.002$). All other comparisons between PRHS levels were non-significant. **CONCLUSION:** The EQ-5D may be sensitive in detecting differences between low and high levels of PRHS but not within severe levels of PRHS.

PPN18

SYSTEMATIC OVERVIEW OF THE PSYCHOMETRIC PROPERTIES OF THE BRIEF PAIN INVENTORY IN MALIGNANT AND NON-MALIGNANT PAIN

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OBJECTIVES: Brief Pain Inventory (BPI) is a self-administered questionnaire used to assess severity and impact of pain on daily functions. Developed for use in cancer pain, it is now being widely used in assessment of both malignant and non-malignant pain. To date, no published studies exist summarizing BPI's psychometric properties for both types of pain. The study objective was to examine the existing evidence of the psychometric properties of BPI use in patients suffering from either type of pain. **METHODS:** A structured literature review was performed to summarize the psychometric properties of the BPI questionnaire in both malignant and non-malignant pain. Published papers and abstracts were retrieved by searching Medline 1983–2006, SciSearch and pain-related websites. Relevant articles cited from these search findings were also reviewed. Key search terms included: Brief Pain Inventory, reliability, responsiveness and validity. Articles were included for critical review if psychometric properties were addressed. **RESULTS:** Of 202 citations, 22 met inclusion criteria for critical review. Factor analysis was used to establish construct validity, which generated 2-items: intensity and interference. Only one study reported 3-items by separating the interference domain by psychological functions/sleep and physical function. Face and content validity were demonstrated for both types of pain. Studies conducting longitudinal analysis showed BPI scales were sensitive to change and able to discriminate among groups of patients based on condition-specific measures of improvement, no change, or a decline. Intraclass correlation coefficient for test-retest reliability was found to range from 0.61–0.76 for pain intensity and 0.81–0.88 for pain interference in malignant- pain. Internal consistency coefficients were approximately 0.85 for the intensity scale and 0.88 for the interference scale with the Cronbach's alpha coefficients ranging from 0.77–0.95 for non-malignant pain. **CONCLUSION:** Evidence supports the use of the BPI as a reliable and valid pain assessment tool in malignant and non-malignant pain.

PPN19

VALIDATION OF INGUINAL PAIN QUESTIONNAIRE

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